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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,805	10/15/2003	Akira Maenishi	L7002.03102	1696

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EXAMINER	
PATEL, VINIT H	

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 05/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/684,805	MAENISHI ET AL.	
	Examiner	Art Unit	
	Vinit H. Patel	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 18* is/are pending in the application.

4a) Of the above claim(s) *18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *15Oct03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group II, claims 1-16, in the reply filed on April 18, 2005 is acknowledged. Claim 18 is withdrawn from further consideration.

Claim Objections

1. Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 2 recites the temperature detector element without further limiting the limitation as written in claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keigo et al., JP Pub. No. 2001-201019, in view of Kawamura et al., US Patent No. 4,915,615.

Regarding claims 1 and 2, Keigo teaches a hydrogen generating device (Abstract) comprising a burner 9 (Drawing 1) having a gas supply pipe 22 (from a fuel supply device); and an air supply way 34, having air blowout holes 27 supplied air from air port 10 (from an air supply device) (Drawing 2) and a reformer (refining machine) 1 (Drawing 1), but does not disclose a temperature detector and flame detector.

Kawamura teaches burner having a temperature sensor 12 disposed in air inlet 6A and a flame sensor 11 disposed in the combustion chamber (having a temperature sensing means) (C2/L26-44). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Keigo in view of Kawamura to provide a temperature sensor and flame sensor for the purpose to provide greater control over fuel combustion (C1/L40-47).

Regarding claim 11, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Keigo in view of Kawamura to provide a plurality of temperature sensors in the combustion space as such modification would provide the expected result of a more accurate temperature sensing ability in order to control fuel combustion. See In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

Regarding claim 12, Keigo teaches the combustion space has a cross section that increases in the flame radiation direction (Drawing 2).

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keigo et al., JP Pub. No. 2001-201019, in view of Kawamura et al., US Patent No. 4,915,615 as applied to claim 1 and in further view of Ono et al., JP Pub. No. 63105317.

Regarding claim 3, Keigo in view of Kawamura teaches all of the limitations as applied to claim 1 above, but does not teach the temperature detector placed to penetrate the air injector. Ono teaches thermocouple 5 penetrating holding pipe 4 (air injector) for the flow of combustion air to the combustion chamber (Fig. 2), and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Keigo in view of Kawamura with Ono for the purpose to enable combustion to be stopped before oxygen is reduced (Abstract, Ono).

4. Claims 4-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keigo et al., JP Pub. No. 2001-201019, in view of Kawamura et al., US Patent No. 4,915,615, and Ono et al., JP Pub. No. 63105317 as applied to claim 3 above, and in further view of Hishikari, JP Pub. No. 59208425.

Regarding claim 4, Keigo in view of Kawamura and Ono teaches all of the limitations as applied to claim 3 above, but does not teach the temperature detector portion being thermally insulated from an inner face of the injection hole. Hishikari teaches a thermocouple 2 with insulating agent 3 and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Keigo in view of Kawamura and Ono to provide the thermocouple with improved heat resistant characteristics (Abstract, Hishikari).

Regarding claim 5, Ono teaches the gap formed between the temperature detector and inner surface of the air injection hole and the width is uniform over an outer periphery of the temperature detector (Fig. 2),

Regarding claim 6, Keigo teaches a plurality of air blowout holes having substantially the same cross section (Drawing 1) and absent unexpected results it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the air injector holes with substantially same cross section airway gap with or without the temperature sensor provided therein, for the purpose to provide uniform airflow characteristics through the air blowout holes.

Regarding claim 7, Ono teaches the temperature detector has its detecting portion at one end and the body contained within the air space (Fig. 2).

Regarding claim 8, Hishikari teaches the end portion of the thermocouple is coated with oxide film (Abstract).

Regarding claim 9, Ono teaches the end portion of the thermocouple is substantially hemispherical (Fig. 10).

Regarding claim 10, Ono teaches the thermocouple is sheath shaped (Figs. 1 & 2; Abstract).

5. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keigo et al., JP Pub. No. 2001-201019, in view of Kawamura et al., US Patent No. 4,915,615 as applied to claim 1 above and in further view of Berger et al., US Patent No. 4,301,968.

Regarding claim 13, Keigo in view of Kawamura discloses all of the as applied to claim 1 above but does not teach an electrode within the fuel distributor and having a portion that protrudes into the combustion space and an ignition circuit electrically connected to the electrode.

Berger teaches ignition electrode 53 located between blast tube 51 and flame cone 56 (in the combustion space) and ignition circuit electrically connected to the electrode (Fig. 10; C8/L5-39), and it would have been obvious to modify Keigo in view of Kawamura with Berger for the purpose to provide an improved fuel burner with increased ignition electrode lifetime (Berger, C2/L40-47).

Regarding claim 14, Berger teaches a switch (C2/L40-47) so that electrode 53 is connected to ignition circuit (Fig. 10) during ignition, and electrode is connected to flame sensor 58 through power supply 57 (C2/L40-47).

Regarding claim 15, Berger teaches the electrode 53 is placed in a different region of the combustion space from the temperature sensor of the flame detector (Fig. 10).

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keigo et al., JP Pub. No. 2001-201019, in view of Kawamura et al., US Patent No. 4,915,615, Berger et al., US Patent No. 4,301,968 as applied to claim 15 above and in further view of Haffner et al., US Patent No. 6,142,665.

Regarding claim 16, Keigo in view of Kawamura and Berger teaches all of the limitations as applied to claim 15 above, but does not teach the temperature detector in an upper region of the combustion space and the electrode in the lower region of the

combustion space. Haffner teaches placement of temperature measuring sensors in a burner (C3/l1-67; Fig. 1) and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Keigo in view of Kawamura and Berger with Haffner for the purpose to determine placement of the temperature detector and electrode in the combustion space to provide a more accurate flame temperature measurement (C2/L17-47).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vinit H. Patel whose telephone number is (571) 272-0856 can normally be reached on 9:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VHP

ALEXA DOROSHENK
PRIMARY EXAMINER